

TITLE OF THE INVENTION

[0001] MODULAR METAL FENCE OR GATE PANEL ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0002] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0003] Not Applicable

REFERENCE TO A "SEQUENCE LISTING"

[0004] Not Applicable

BACKGROUND OF THE INVENTION

[0005] This invention relates to a modular metal fence or gate panel assembly of the type constructed from rails and pickets. Each panel section making up a portion of the gate or fence can be boxed and transported in unassembled form and assembled or erected on site requiring limited assembly skills or assembly tools. As a result, the modular panel section can be assembled on site either by professionals or homeowners.

DESCRIPTION OF THE PRIOR ART

[0006] United States Patent 5,454,548 - Moore issued October 3, 1995 discloses modular metal fencing or gratings employing vertically spaced apart upper and lower support rails and a horizontal row of vertically disposed pickets which extend through apertures provided in the rails. In order to lock a given rail to the pickets which extend through the rail, an elongate "L"-shaped bar is slidably located within the rail and thus can engage uniformly oriented slots in the side of the pickets extending therethrough. Because of the length of the "L"-shaped bar, the panel cannot be assembled in situ between the supporting posts located at either end of the panel. Rather, the panel must be assembled on the ground and when the rails and pickets are locked together by the "L"-shaped bar, only then positioned between the panel support posts. A further drawback as a result of the use of the "L"-shaped locking bar is the fact that the slots in the pickets which are received by the bar must be cut into three sides of the picket, thereby weakening its structure. Further, each picket must pass through a total of four apertures provided in the upper and lower rails which can result in unwanted damage to the exterior finish on the pickets.

[0007] A modular rail and panel assembly similar to the foregoing is disclosed in United States Patent 5,882,001 issued March 16, 1999 - Reinbold. In this panel arrangement, the upper portion of each rail which is in

the form of an inverted "U"-shaped channel, is provided with a plurality of longitudinally spaced apertures for receiving a picket inserted therein. Each aperture has a tab portion which positively engages with a slot provided in the sidewall of the picket. The picket is then held in this engagement position by means of a picket locking fastener or wedge which is interposed in the aperture between each picket opposite the tab and the opposite limit of the aperture diametrically opposed to the tab. As an average fence panel contains 24 pickets, assembly of the panel is time consuming since 48 wedges must be inserted. Additionally, and like the above-described modular assembly of Moore, the exterior finish of the pickets can be damaged during assembly and particularly when the wedges are forced into position by means of a hammer or the like.

SUMMARY OF THE INVENTION

[0008] The novel metal picket fence or gate panel assembly of my invention is similar to the foregoing modular assemblies in the sense it is fabricated from spaced apart and vertically aligned upper and lower support rails each defined by an inverted "U"-shaped channel having an elongate top portion and a plurality of vertically spaced apart picket receiving apertures extending therethrough and which is accompanied by a horizontal row of vertically disposed elongate pickets which respectively extend through vertically aligned pairs of picket receiving apertures in the upper and lower support rails. Further, and like the known assemblies described above, the

pickets of my invention each have uniformly oriented rail connecting recesses in at least one sidewall thereof and positioned at locations therealong corresponding to the relative positioning of at least one, and preferably both, of the upper and lower support rails.

[0009] In accordance with one aspect of my invention, fastening means is provided for positively connecting one or both of the support rails to corresponding rail connecting recesses in the elongate pickets and which consists of an elongate bar having spaced bar apertures extending therethrough. The elongate bar is designed to be slidably disposed within the support rail and when in the support rail, moveable from a first position wherein respective ones of the bar apertures are in full open alignment with corresponding ones of the picket receiving apertures to a second position wherein at least one inwardly projecting flange or tab in respective ones of said bar apertures are received in corresponding ones of the rail connecting recesses.

[0010] The foregoing fastening means arrangement allows the panel to be either assembled and locked together on the ground or alternatively, assembled in location between two vertical support posts located at the ends of each panel section.

[0011] Because the elongate bar moves between two positions, each bar aperture for permitting the passage of the picket therethrough and thereafter positively connecting the picket to the rail has a first open portion the dimensions of which at least correspond to the dimensions of the picket receiving recess, and a second open portion of lesser surface area than the first and which includes the inwardly projecting flange or tab for engagement with rail connecting recess on the pickets.

[0012] In order to better facilitate the correct alignment of the rails with the associated pickets extending therethrough and hence enable the elongate bar carried by the rail to slidingly move between its first open and second locking position, where the support rails are substantially identical as are the elongate pickets, a collar surrounding the picket can be advantageously positioned at the same location on each of the pickets such that when the collars abut the top portion of the upper support rail, the location of the upper support rail relative to the corresponding rail connecting recesses in the pickets is determined and which as a consequence thereof, enables the elongate bar to be slidingly moved within the rail from its first open to its second locked position. The collar itself may be made of metal and attached to the picket at its predetermined location by soldering, welding or the like. Alternatively, the collar may be made from suitable plastic material which frictionally engages the outer surface of the picket and is positioned at its

predetermined location. After assembly, and if desired, the plastic collar used for alignment purposes can be removed by cutting off.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In the accompanying drawings:

[0014] Fig. 1 is a front elevation view of two panel assemblies used in swing gates and a single panel assembly as used in conventional fencing;

[0015] Fig. 2 illustrates in exploded perspective the componentry of a typical picket and rail assembly featuring the novel fastening means of this invention used to positively secure the rail to the pickets;

[0016] Fig. 3 is a perspective cutaway view illustrating a picket being inserted into the upper and lower rails when the rail aperture and the aperture in the sliding bar are in aligned and fully opened relationship;

[0017] Fig. 4 is a cross-sectional end view of the upper rail and picket when the latter is in its locked position;

[0018] Fig. 5 is a cross-sectional view of the rail and picket assembly taken along the lines V-V of Fig. 4;

[0019] Fig. 6 is a cross-sectional view of a similar assembly taken along the lines VI-VI of Fig. 5 but where the locking tab is tapered and extends through only one slot in the picket; and

[0020] Fig. 7 is a similar cross-sectional view to that of Fig. 6 but where the picket is tubular in cross-section and the aperture in the elongate locking bar has been modified in order to accommodate same.

DETAILED DESCRIPTION OF THE DRAWINGS

[0021] The metallic panel assemblies of this invention and which are intended to be used as gate or fence panels are generally illustrated in Fig. 1. Panel assemblies A and B are identical to each other and when employed as gate panels, are respectively pivotally connected to supporting posts or uprights 20 and 30, employing for that purpose like pairs of upper pivot connectors 21 and 31 and like pairs of lower pivot connectors 22 and 32 which are well known in the art.

[0022] In a like fashion, fence panel C is held in fixed position between support posts or uprights 30 and 40 and are also attached thereto employing for that purpose upper connectors 33 and 43 and lower connectors 34 and 44 which, like the gate pivot connectors, are well known in the art. As illustrated, the panel assembly functioning either as a swing gate panel assembly or as a

stationary fence panel assembly are constructed from upper gate rails 25, 35 and 45, lower elongate rails 26, 36 and 46 and a multiplicity of vertically aligned pickets 27, 37 and 47. As illustrated, it will be observed that the pickets 27 and 37 which form gate panels A and B are of differing lengths for ornamental purposes. Vertically disposed upper and lower rails 45 and 46 of fence panel C support vertically aligned pickets 47 which are of equal length.

[0023] An exploded view of one picket 47 and upper rail 45 forming part of the fence panel C is illustrated in Fig. 2. In this particular drawing, picket 47 is tubular and square in cross-section and has attached to it in a known manner upper end cap 48. Surrounding picket 47 is collar 49 proximate its upper end and the function of which is described in greater detail below. Each picket 47 also includes upper rail connecting recesses 60 and 61 located in opposed sidewalls of the picket, and optionally, lower rail connecting recesses 62 and 63 located in the same opposed sidewalls of picket 47.

[0024] Although the lower support rail 46 is not illustrated in Fig. 2, it is identical to upper support rail 45 and thus the following description applies to both. Each support rail is defined by an inverted "U" - shaped channel having an elongate top portion 70 and depending sidewalls 71 and 72. The interior of these sidewalls each include an inwardly projecting elongate rails 73 and 74 which are arranged in opposed relationship so as to slidably

accommodate elongate bar 80 when positioned between rails 73 and 74 and the interior portion of top section 70. Top portion 70 is itself provided with a plurality of spaced apart picket receiving apertures 75 which are dimensioned to compliment the exterior dimensions of picket 47 that extends therethrough.

[0025] Elongate bar 80 which functions as a locking or "shutter" bar is itself provided with a plurality of spaced apart bar apertures 81 complimenting the apertures 75 in upper rail 45.

[0026] With reference to Figures 2 through 6, bar 80 which is located interior of at least upper rail 45, is slidingly movable from an first position wherein respective ones of the bar apertures 81 are in full open alignment with corresponding ones of the picket receiving apertures 75, to a second position whereby inwardly projecting flanges or tabs 82 extending inwardly of each aperture 81 are received in rail connecting recesses 60 and 61 of picket 47. If bottom rails 26, 36 or 46 also include a locking bar 80, the projecting tabs or flanges 82, when in the second sliding position, engage rail connector recesses 62 and 63 located proximate the lower end of the picket and best seen in Figure 2. Where the panel assemblies function as gate panels A and B seen in Figure 1, for panel rigidity, rails 26 and 36 are provided with locking bars 80.

[0027] In order to facilitate sliding movement of bar 80 within rails 25,

26, 35, 36 and 45 and optionally rail 46, bar 80 proximate its end has attached to its undersurface tab 83 which projects downwardly and which can be finger grasped or impacted with a drift in order to move it from its first open to its second locked position.

[0028] In keeping with one aspect of this invention, pickets 47 preferably are provided with metal or plastic collars 49 which are located at the same position along the length of each picket so that when the pickets are inserted through aperture 75, recesses 60 and 61 are in a position to register with tabs 82 of bar 80 when the bar is moved into its second locking position. Further, and in order to assist the entry of tabs 82 into and through recesses 60 and 61 in the sidewalls of pickets 47, the leading end of tabs 85 are inwardly tapered. Advantageously, even where the pickets are of different lengths as seen in gate panels A and B in Figure 1, the collars can be positioned at preselected positions on pickets in order to facilitate alignment of the locking bar with the recesses in the pickets.

[0029] While pickets having rectangular sidewalls have been illustrated in Figures 1 through 6, it will be obvious that pickets having different sidewall configurations, such as triangular, circular or polygonal can be employed. Fig. 7 illustrates sliding bar 80 designed for use with a tubular picket 90 having a circular cross-section and wherein the opposed slots in the sidewall of the circular picket, unlike that for the picket having rectangular sidewalls,

extend in a direction perpendicular to the longitudinal extent of the bar 80 and hence when the bar 80 is in its second position, are engaged by inwardly projecting tabs 91 and 92.

[0030] It will also be apparent that for locking purposes, only one locking tab need be employed and it can be used to engage only one single recess provided in the sidewall of the picket.